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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/337,040	06/28/1999	MITSURO SUGITA	684.2864	8450
5514	7590	04/28/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			NGUYEN, HUNG	
30 ROCKEFELLER PLAZA			ART UNIT	
NEW YORK, NY 10112			PAPER NUMBER	
			2851	

DATE MAILED: 04/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/337,040	SUGITA ET AL.	
	Examiner	Art Unit	
	Hung Henry V Nguyen	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed 2/3/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-26, 38-45, 49, 50, 63-75, 83, 98-103, 108-111, 113-116, 121-124, 126-129, 134-137, 139-174 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39-41, 63-75, 108-111, 121-124 and 134-137 is/are allowed.
- 6) ☒ Claim(s) 13-25, 100-103, 113-116, 26-129; 38, 42-45, 50; 83, 98-99; 139-174 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 13-25, 100-103, 113-116, 26-129 ; 38, 42-45, 50; 83, 98-99; 139-174 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification of the disclosure lacks adequate support for the claimed provision of “wherein an exposure amount applied by said first exposure means to the predetermined exposure region is less than a permissible exposure amount”.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13-25, 100-103, 113-116, 26-129 ; 38; 42-45, 50; 83, 98-99; 139-174 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As to claims 13, 38, 83, 139, 156, 172, the recitation of ““wherein an exposure amount applied by said first exposure means to the predetermined exposure region is less than a permissible exposure amount” is vague and indefinite (see rejection under 35 U.S.C. 112, first paragraph, supra).

Claim Rejections - 35 USC § 102 or 103(a)

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 13-19, 21-25, 100-103, 126-129 are rejected under 35 U.S.C. 102(e) as being anticipated by Von Bunau et al (U.S.Pat. 5,863,712) or in the alternative, under 35 U.S.C. 103(a) as obvious over Yanagihara et al (U.S.Pat. 5,617,181)

With regard to claims 13, 21-25, 100-103, 126-129, Von Bunau et al et al (fig.9) discloses an exposure apparatus comprising all of the limitations of the instant claims such as: a light source (90); an optical element (91-93) disposed at the light source side of the reticle (94) and having first exposure means (92, for instance) for illumination a predetermined mask with light of a predetermined wavelength under the first mask illumination condition for exposing a first pattern onto a predetermined region (74) and a second exposure means (96 for example) for illumination a predetermined mask with light of a predetermined wavelength under the second mask illumination condition for exposing a second pattern onto the predetermined exposure region 974) where the first mask illumination condition is different with the second mask illumination condition. Von Bunau clearly teaches that “the pupil filter is replaced or rotated during either a plurality of exposures or during a single exposure onto the same position on the

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surface of a wafer substrate that is to be exposed” (see abstract). Von Bunau further discloses the first exposure and second exposure are carried prior to a development process, in the statement of “as the result of applying the multiple exposure to wafer 97 coated with photoresist and developing it, a resist pattern faithful to the shape of the mask pattern can be formed” (see col.14, lines 1-4). This is a concrete evidence that in an exposure apparatus for transferring a multiple patterns formed on a same mask onto a wafer as taught by Von Bunau et al, all exposures must be performed before the development process for lithographically printing a circuit pattern on photosensitive wafer. Von Bunau also discloses a projection optical system (95) for transferring a predetermined pattern formed the mask onto the substrate. Von Bunau teaches under the first mask illumination condition, the predetermined mask is illuminated with a first sigma, and under the second mask illumination condition, the predetermined mask is illuminated with a second sigma, different from the first sigma (see col.8, lines 60-67). Von Bunau further teaches there are plural opening patterns juxtaposed with each other on a single reticle (see figures 4-5). Thus, Von Bunau teaches all of the limitations of the instant claims. Applicant argued that the present invention is allowable over Von Bunau since Von Bunau does not clearly disclose “wherein the exposure amount applied by the first exposure means to the predetermined exposure region is less than a permissible exposure amount”. (see remarks, filed 2/3/04, page 34, lines 14-20), however, it is the Examiner’s position that firstly, the present application does not disclose that limitation (see rejection under 35 U.S.C. 112, first and second paragraph). Secondly, Von Buanau meets the limitation as claimed. In Von Bunau, this is supported in, for example, figures 4, 5, 17 of Von Bunau. Clearly, it is shown that “conversely to Figures 4(a), Figure 5 (a) illustrates a mask pattern in which an opaque line segment 50 is

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formed in a bright background 51, by using mask patterns A, C, and D. By performing an exposure with pupil function A, the projected image in which dark image 52 is formed in bright area 53 is obtained as shown in figure 5(b). If the line width is close to the resolution limit of the projection system and image 52 is formed by adjusting the exposure dose so that the width of the projected image is equal to the width of the original pattern outline 54 shown by a broken line” (see col.7, lines 28-35) and “the maximum light intensity of the projected image shown in fig 5(d) is very small compared to the case of figure 5(c)” (see co.8, lines 7-10). This is an evidence that the exposure amount provided by the fine exposure is less than the permissible exposure amount. Lastly, it is the Examinee’s position that, one having ordinary skill in the art would know clearly that the first exposure must be less a permissible exposure amount. For example, Yanagihara et al discloses an exposure apparatus and corresponding method for performing multiple exposures while changing an exposure condition wherein the exposure amount applied by the exposure means to the predetermined region is controlled not greater than the predetermined exposure amount (see abstract). In view of these teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Von Buau et al and Yanagihara to obtain the invention as claimed. It would have been obvious to control the exposure amount of Von Bunau’s device, applied by the first exposure means to the desired exposure area on the wafer being less than a permissible exposure amount as taught by Yanagihara so that the total exposure amount is not greater than the desire exposure amount, whereby the quality of the images to be printed is greatly improved.

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Allowable Subject Matter

7. Claims 39-41, 63-75, 108-111, 121-124, 134-137 were allowed in the previous office action.

Response to Amendment

8. Applicant's amendment filed 2/3/04 has been entered. Applicant's arguments have been fully considered but they are not found persuasive. Applicants have amended the claims to more define the present invention. However, the newly added limitations are not supported in the specification as discussed above. The applicants admitted that the added limitation of "an exposure amount applied by said first exposure means to the predetermined exposure region is less than a permissible exposure amount" does not appear in haec verba in the specification." For its support applicant's relies upon figures 4, 12, 25, 28, and 29. The Examiner respectfully disagrees with the applicant since these drawings are not even the remotest relevancy to the added claimed subject matter. Applicant is reminded that when claimed subject matters are not fully discussed in detail, this falls under 112, first paragraph and applicant's disclosure is clearly lacking in this aspect. Applicant argued that "an image of a mask pattern is transferred to a wafer; clearly, this exposure is carried out with an exposure amount less than the permissible exposure amount; if the exposure amount applied to the wafer is greater than the permissible exposure amount, the "image" given to the wafer would be directly printed on the wafer by a subsequent development process" (see remarks, page 32, lines 6-9). This argument is not found persuasive at all. In the Examiner's opinion, figure 4 (for example) only illustrates the shapes of effective light sources to be defined for the coarse and fine exposures. Figures 4, 12, 25, 28 and

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29 do not even remotely relate to “an exposure amount applied by said first exposure means to the predetermined exposure region is less than a permissible exposure amount”, as argued.

Turning now to the prior art rejection, again, applicant’s arguments have been carefully reviewed but have been traversed in view of new ground of rejections as set forth above.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

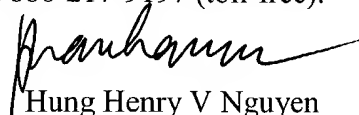
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Russ Adams can be reached on 571-272-2112. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hung Henry V Nguyen
Primary Examiner

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hvn
4/19/04